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G4H HKK

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GB 2347247 A **GB 2335059 A**
GB 2266797 A **EP 0651315 A1**
WO 00/24179 A1

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ONLINE: WPI, JAPIO, EPODOC

(54) Abstract Title
Retrieving address book text using disambiguation of ambiguous key sequences

(57) In a data communications device such as a mobile handset or PDA, a number of text characters may be associated with each key on the keypad (3 fig.3). To avoid having to use multiple depressions of a key to select the required characters of a word (e.g. for "home" the key sequence is "44,666,6,33"), it is possible to depress each key only once (e.g. "home" is then "4663") and use disambiguating software to determine all the words corresponding to the ambiguous key sequence (e.g. "4663" also corresponds to "good"). These are then displayed to a user for selection. The disambiguating software uses a dictionary stored in memory. The invention applies this technique to text entries in an address book, so it is possible to input names or nicknames and which are not in the normal disambiguating software dictionary. Preferably the address book is on a removable SIM card and the disambiguating software can disambiguate text entries corresponding to names in the address book. Text entry may be applied to email and SMS.

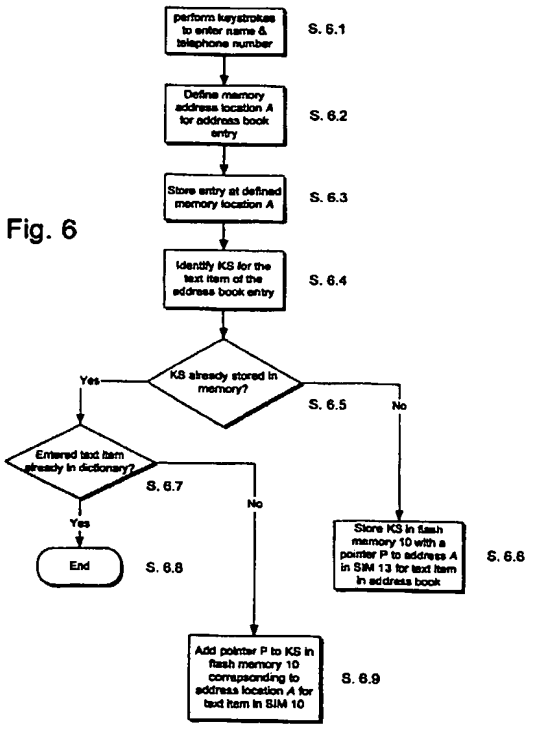


Fig. 6

GB 2 369 750 A

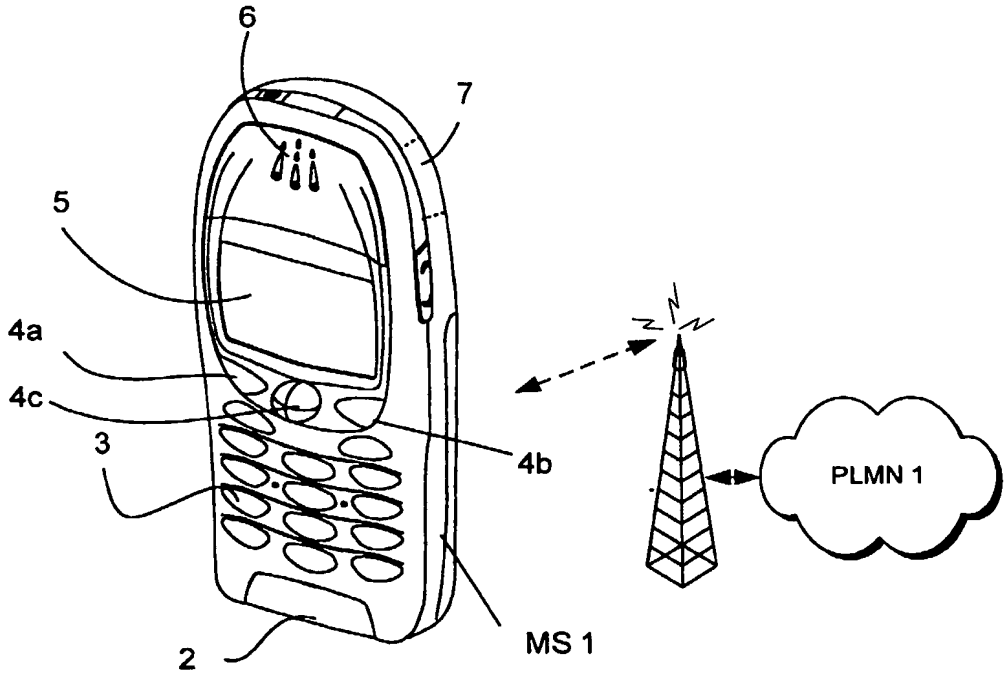

6
7
5
4a
4c
3
4b
2
MS 1
PLMN 1

Fig. 1

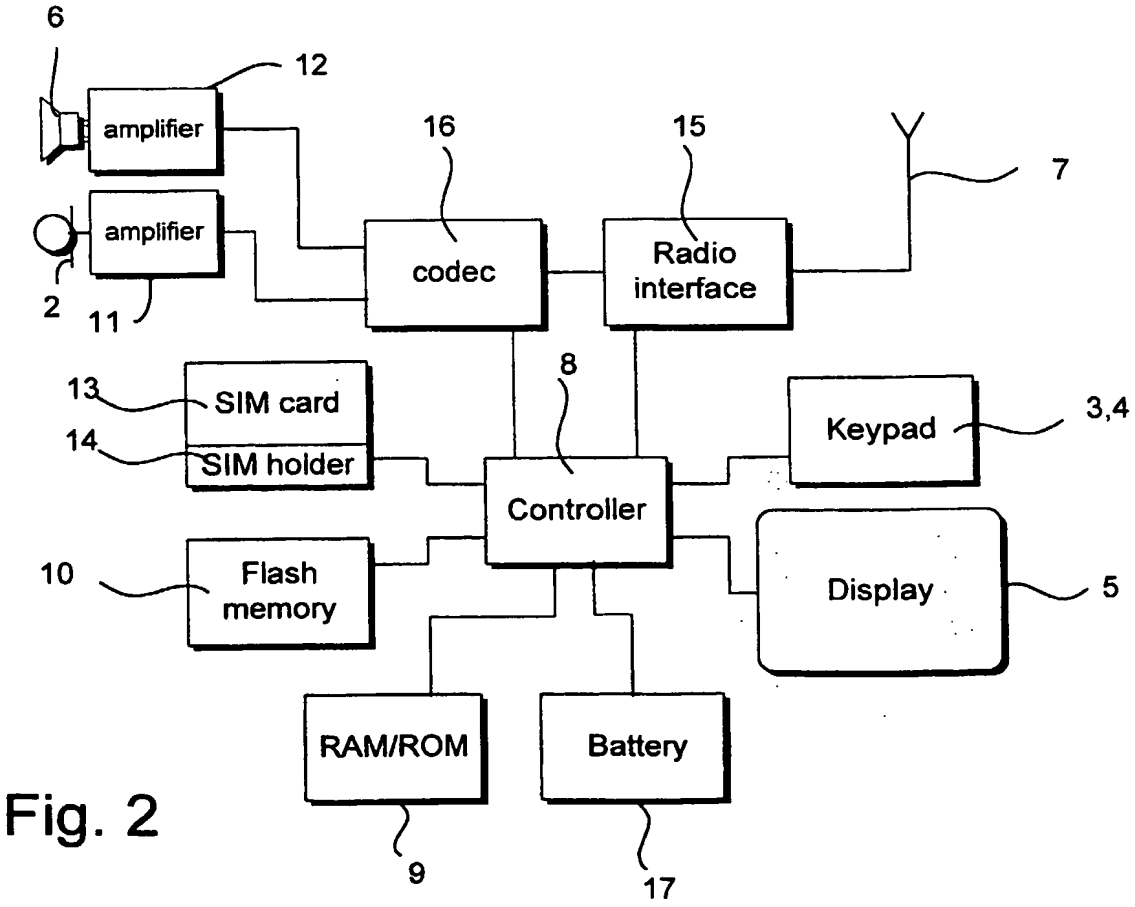

6
12
amplifier
16
15
7
amplifier
codec
Radio interface
2
11
8
13
SIM card
3,4
14
SIM holder
Keypad
Controller
10
Flash memory
Display
5
RAM/ROM
Battery
9
17

Fig. 2

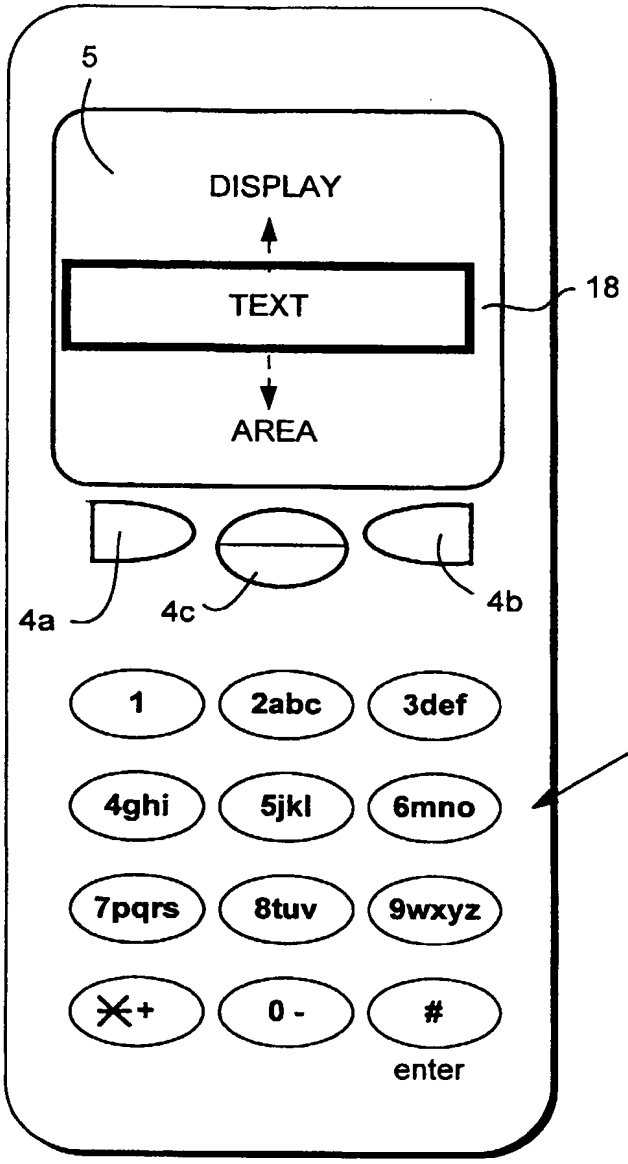

5
DISPLAY
TEXT
AREA
18
4a
4c
4b
1
2abc
3def
4ghi
5jkl
6mno
7pqrs
8tuv
9wxyz
0 -
#
enter
3

Fig. 3

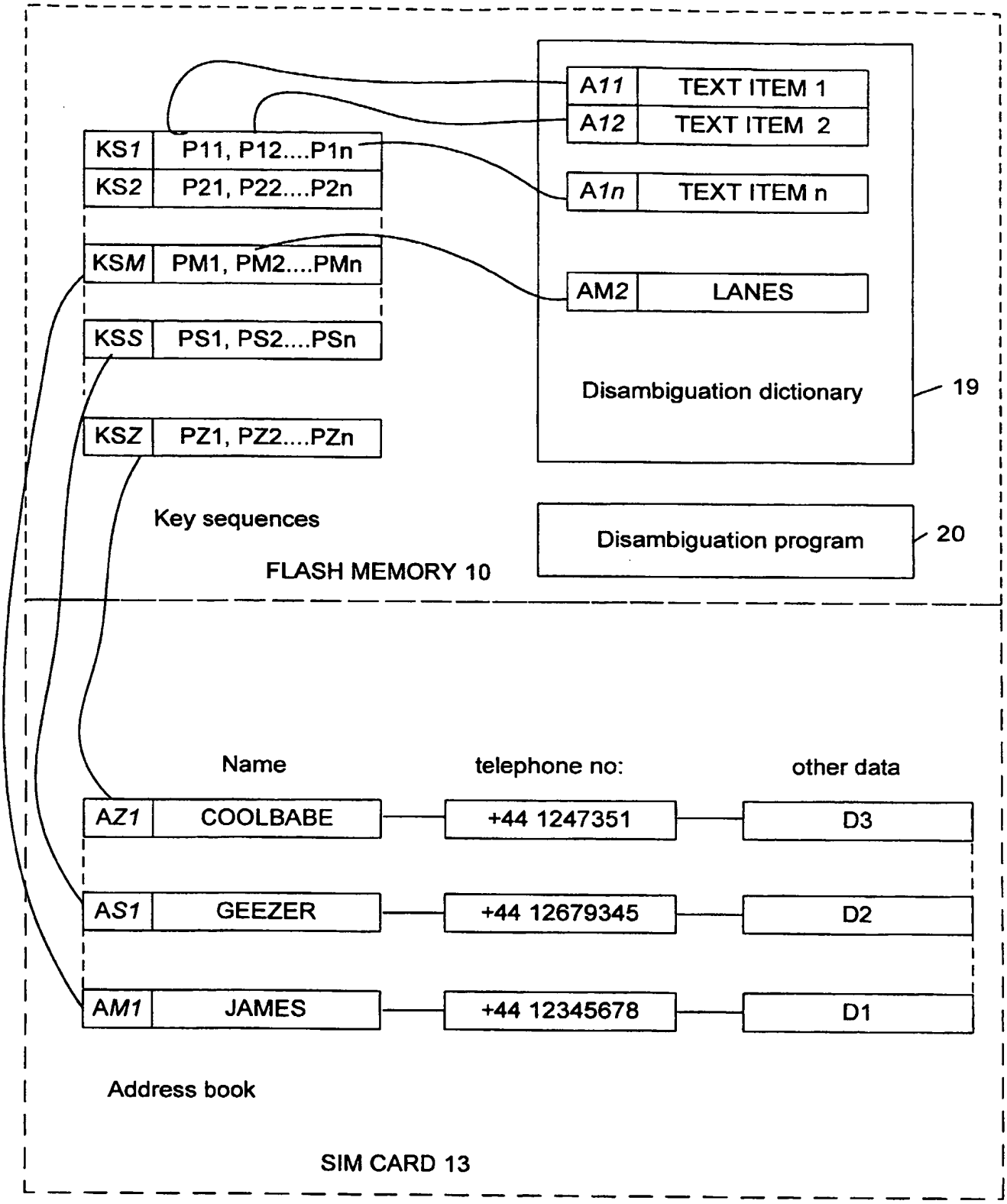

A11
TEXT ITEM 1
A12
TEXT ITEM 2
A1n
TEXT ITEM n
AM2
LANES
Disambiguation dictionary
19
KS1
P11, P12....P1n
KS2
P21, P22....P2n
KSM
PM1, PM2....PMn
KSS
PS1, PS2....PSn
KSZ
PZ1, PZ2....PZn
Key sequences
FLASH MEMORY 10
Disambiguation program
20
Name
telephone no:
other data
AZ1
COOLBABE
+44 1247351
D3
AS1
GEEZER
+44 12679345
D2
AM1
JAMES
+44 12345678
D1
Address book
SIM CARD 13

Fig. 4

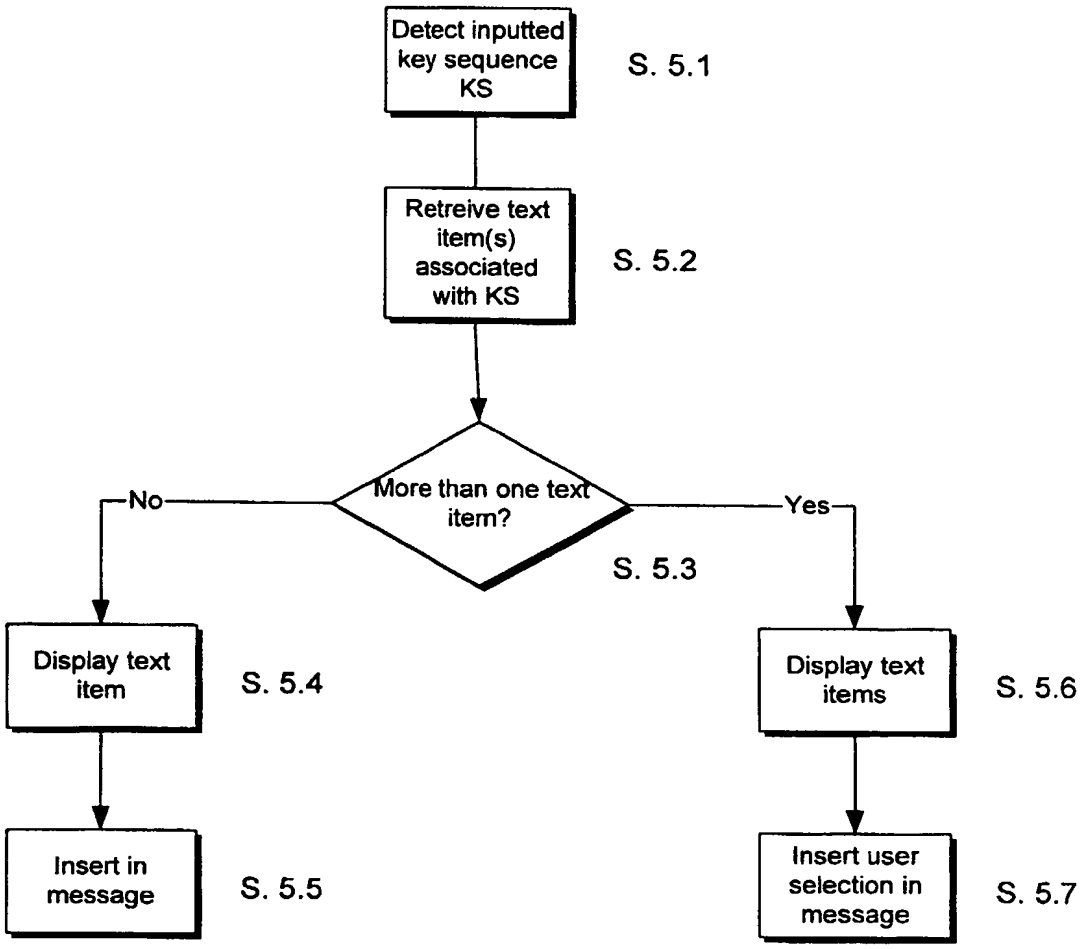
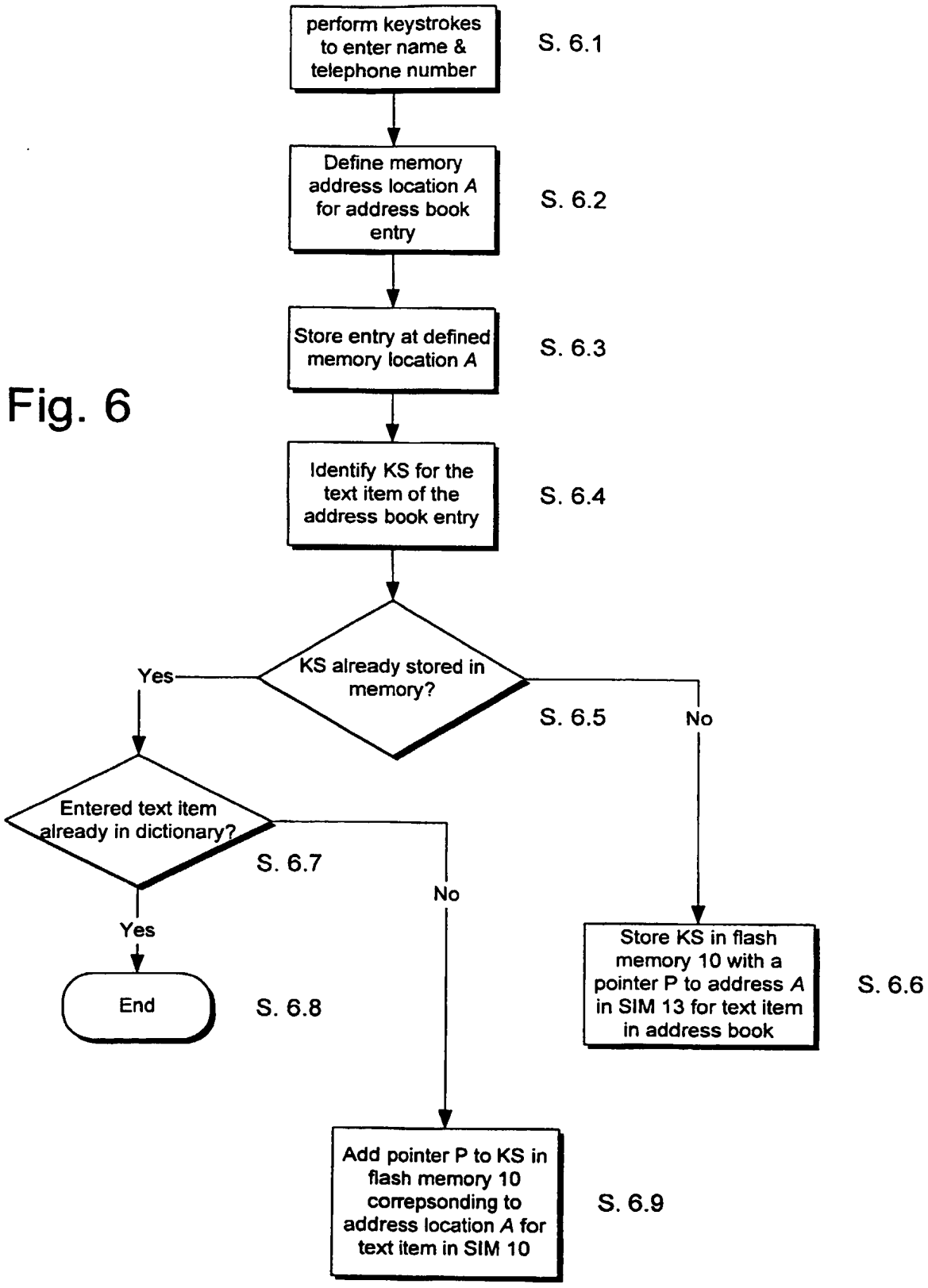

Detect inputted key sequence KS
S. 5.1
Retreive text item(s) associated with KS
S. 5.2
More than one text item?
S. 5.3
No
Yes
Display text item
S. 5.4
Insert in message
S. 5.5
Display text items
S. 5.6
Insert user selection in message
S. 5.7

Fig. 5

Fig. 6


perform keystrokes to enter name & telephone number
S. 6.1
Define memory address location A for address book entry
S. 6.2
Store entry at defined memory location A
S. 6.3
Identify KS for the text item of the address book entry
S. 6.4
KS already stored in memory?
S. 6.5
Yes
No
Entered text item already in dictionary?
S. 6.7
Yes
No
End
S. 6.8
Store KS in flash memory 10 with a pointer P to address A in SIM 13 for text item in address book
S. 6.6
Add pointer P to KS in flash memory 10 correpsonding to address location A for text item in SIM 10
S. 6.9

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Communications Device

This invention relates to a communications device and has particular application to mobile communications devices such as a mobile telephone handset or personal digital assistant (PDA).

It is well known that conventional mobile telephone networks provide messaging services, in addition to voice telephony. For example, in the global system for mobile communication (GSM), a short message service (SMS) is provided by which users of mobile telephone handsets or other communications devices can type a text message and send it to a recipient at another mobile station coupled to the network.

Also, mobile communications devices may be configured for use with Wireless Application Protocol (WAP), which permits the sending and receiving of e-mail through the Internet.

Conventionally, mobile telephone handsets have a keypad with a limited number of keys, primarily designed for entering numerical information corresponding to a telephone number. Also, they can be used to enter individual letters of the alphabet when composing a message. To this end, each key, in addition to being associated with a number, is also associated with a group of letters of the alphabet and other text characters. When composing a message, the key associated with a particular letter or character is repeatedly pressed so as to cycle through the individual letters or other characters associated with the key until the desired character is displayed. Although this procedure works satisfactorily, it is time consuming and not particularly user friendly.

More recently, disambiguation software has been developed, for example as described in US Patent Nos. 5,818,437 and 5,953,541, assigned to Tegic Communications Inc of Seattle, Washington, USA, which has been incorporated into many mobile telephone handsets e.g. the Nokia model 3210. When entering a word using the software, the user operates each key only once rather than scrolling through the individual characters associated with the key. Thus, each key operation

has an associated ambiguity due to the fact that a number of characters are associated with the key. Accordingly, the key sequence produced by actuating keys corresponding to a word only once has an associated ambiguity because the sequence could represent more than one word. In order to resolve the ambiguity of this inherently ambiguous key sequence, a word or words corresponding to the ambiguous key sequence are stored in the memory and displayed to the user so that a selection can be made. This procedure greatly reduces a number of key strokes required to enter text.

Disambiguation is carried out by reference to pre-programmed dictionary of words associated with the individual ambiguous key sequences. The dictionary can be updated by the user so as to include additional text items such as words or phrases. The updating requires the text to be inserted character-by character according to the conventional technique previously described.

It is also well known that mobile telephones include an address book which contains a list of user programmable telephone numbers and associated reference names, which may comprise nicknames or other personalised identifications.

The present invention provides an improved way of using disambiguation software by making reference to an address book memory.

Broadly stated, the invention provides a data communications device for sending communications containing textual information to individual recipients, comprising an address memory containing routing information for routing a communication to an individual recipient as selected by a user, the routing information for the recipient containing textual information corresponding to their name, a plurality of keys each associated with a respective plurality of different text characters, the keys being operable by the user to produce an ambiguous key sequence corresponding to an item of textual information for the communication, a memory configuration to store different ones of said ambiguous key sequences and to associate with each thereof at least one item of textual information corresponding to the ambiguous key sequence, and a data processor operable in response to the user actuating the keys

to produce one of the ambiguous key sequences, to retrieve the textual information associated therewith from the memory configuration to permit the user to disambiguate the key sequence, wherein an ambiguous key sequence corresponding the name of a recipient stored in the address memory is stored in the memory configuration and associated with said name whereby to retrieve text corresponding to the name in response to the user actuating the keys to produce the ambiguous key sequence associated with the name.

By means of the invention, the user can make use of the disambiguation software to speed up entry of text items such as nicknames held in the address memory which would not otherwise be associated with the ambiguous key sequences. The invention has particular application to a mobile telephone handset or a PDA and may be used for sending an SMS or e-mail or accessing a telephone number or e-mail address.

The memory unit may be removable from the communications device and may comprise a smart card such as a SIM card

Alternatively stated, the invention provides a mobile communications device with an address book and disambiguation software operable to disambiguate inputted text, characterised in that the software is operable in respect of text entries in the address book.

The invention also includes a method of programming a communications device according to any preceding claim, which comprises identifying an ambiguous key sequence corresponding to a name for the address memory, and storing an association between the identified ambiguous key sequence and the name.

In a further aspect the invention provides disambiguation software for a mobile communications device with an address book, operable disambiguate inputted text, characterised in that the software is configured to be operable in respect of text entries in the address book.

In another aspect the invention provides a smart card for use with a communication device, comprising an address book of names and associated address information configured for use with disambiguation software, wherein the names in the address book are utilisable by the software.

In order that the invention may be more fully understood an embodiment thereof will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a schematic block diagram illustrating a mobile telephone handset which can communicate through a public land mobile network (PLMN);

Figure 2 is a schematic block diagram of the circuitry of the mobile handset shown in Figure 1;

Figure 3 illustrates schematically the display of the handset and the associated keys 4;

Figure 4 is a schematic illustration of the memory organisation for the flash memory in SIM card shown in Figure 2;

Figure 5 is a schematic flowchart of the process for retrieving text items from the disambiguation dictionary; and

Figure 6 is a schematic flowchart of process for entering new address book items.

In Figure 1, a mobile station in the form of a battery driven telephone cellular handset MS 1, is shown schematically in radio communication with PLMN 1. The mobile handset MS1, includes a microphone 2, keypad 3, soft keys 4, a liquid crystal display device 5, ear-piece 6 and internal antenna 7.

The circuitry of the handset MS 1 is shown in more detail in Figure 2. Signal processing is carried out under the control of a digital micro-controller 8 which has an associated RAM/ROM 9 and flash memory 10. Electrical analogue audio signals are produced by microphone 2 and amplified by pre-amplifier 11. Similarly, analogue audio signals are fed to the ear-piece 6 through an amplifier 12. The micro-controller receives instruction signals from the keypad and so-called soft keys 4a,b,c, and controls operation of the LCD display 5.

Information concerning the identity of the user is held on a smart card 13 in the form of a GSM SIM card which contains the usual GSM international mobile subscriber identity and encryption K_i that is used for encoding the radio transmission in a manner well known *per se*. The SIM card 13 is removably received in a SIM card holder 14. Radio signals are transmitted and received by means of the antenna 7 connected through a r.f. stage 15 to a codec 16 configured to process signals under the control of a micro-controller 8. Thus, in use, for speech, the codec 16 receives analogue signals from the microphone amplifier 11, digitises them into a form suitable for transmission and feeds them to the rf stage 15 for transmission through antenna element 7 to PLMN 1 shown in Figure 1. Similarly, signals received from PLMN 1 are fed through the antenna element to be demodulated by the rf stage 15 and fed to codec 16 so as to produce analogue signals fed to amplifier 12 and ear-piece 6.

As known in the art, GSM provides a short message service (SMS) which allows users to type a text message, which is transmitted through the PLMN to another mobile handset and displayed on its display 5. The text message is composed using the keypad 3 of the handset MS1. The text is inputted into a focus region 18 of the display 5 shown in Figure 3. The focus region can be scrolled up and down the display by means of a scrolling key 4c for text selection as will be described later.

As shown in Figure 3, some of the keys for keypad 3 are associated both with numbers and alphanumeric characters. For convenient reference, the individual keys will be identified by their number e.g. the key marked with the number 3 will be referred to as the "3-key". Thus, the 4-key is associated not only with the number "4" but also the letters "ghi". Conventionally, an individual one of the associated letters is selected by successive operations of the 4-key. For example, if the letter "i" is to be inserted into the text message, on the first operation of the 4-key, the letter "g" is displayed, the second operation displays "h" and the third operation displays "i". A further operation displays "4" when entering text for an SMS. It will be understood that by this approach, the limited number of keys of the keypad can be used to enter all the letters of the alphabet and other characters for conventional punctuation.

However, a problem with this conventional text entry technique is the multiple use of keys is laborious, time consuming and not particularly user friendly.

More recently, mobile stations have been provided with disambiguation software which simplifies the entry of text. The disambiguation software allows individual key entries to be used instead of multiple entries as in the past. The user enters an ambiguous key sequence, comprising a sequence of individual key operations. For each key operation in the ambiguous sequence, the key marked with the group of letters containing the desired letter is operated once. Individual ambiguous key sequences are stored in the memory, each associated with words or like text items corresponding to the sequence. Since the key sequence is inherently ambiguous, more than one word corresponding to the sequence may be stored and the user is given an option to select one of them. For example, successive operation of the keys, 4, 6, 6, 3 shown in Figure 3 could correspond to the entry of the word "home" or "good". The ambiguous key sequence "4663" is however associated in the memory with text items "home" and "good" so that when the ambiguous key sequence is entered by the user, both the words "home" and "good" are displayed on the display 5 and the user can then make a selection. For some key sequences, there will be only one item of text associated with it, in which case the user does not need to make a selection. It would be understood that this text entry method is much simpler for the user because individual keys do not need to be operated repetitively to select individual characters. Disambiguating software is marketed by Tegic Communications Inc of Seattle, Washington, USA and is described in more detail in US patent specification nos. 5,818,437 and 5,953,541.

As known in the art, the SIM card 13 stores an address book which is selectively programmable by the user to contain a list of names and associated telephone numbers. The address book is selectively programmable by the subscriber and often the names are stored as nicknames or other abbreviations not necessarily found in a conventional dictionary.

In accordance with the invention, the disambiguation software is used in relation to the names stored in the address book. Figure 4 illustrates the memory organisation for flash memory 10 and SIM card 13. The flash memory 10 amongst other things includes stored ambiguous key sequences KS1 – KSM – KSS – KSZ. Each ambiguous key sequence corresponds to sequence of individual actuation of the keys of keypad 3.

As previously explained, each individual ambiguous key sequence KS may correspond to more than one text item such a word or phrase and the corresponding words or phrases are stored in a disambiguation dictionary 19 within the flash memory 10. In more detail, each key sequence KS is stored with a set of associated pointers P which point to memory address locations corresponding to the text items which are associated with the key sequence in order to enable the user to resolve an ambiguity associated with the key sequence.

Considering for example key sequence KS1, pointers P11, P12... P1n indicate the address locations of text items 1-n which correspond to the ambiguous key sequence KS1. In this example, the pointer P11 points to address A11 at which text item 1 is stored. Similarly, pointer P12 points to the address of text item 2 stored at address location A12. Each ambiguous key sequence KS includes a sufficient number of pointers P corresponding to all of the stored text items appropriate to resolve the ambiguity of the key sequence. Thus generally, key sequence KS1 includes up to n pointers, which points to the addresses for corresponding n text items. In Figure 4, this is illustrated schematically by pointer P1n which points to address A1n corresponding to text item n.

For example, the ambiguous key sequence may comprise a sequential operation of the keys 4, 6, 6, 3 of the keypad 3. As previously explained, this sequence of key operations is ambiguous because it could represent either the word "home" or "good". Thus, in this example, the pointer P11 points to address A11 which corresponds to the location of text item 1 – "good", whereas pointer P12 points to address A12 corresponding to text item 2 – "home".

In operation, the controller 8 shown in Figure 2 runs a disambiguation program 20 shown in Figure 4 so that when the user operates the keypad and produces the key sequence KS1, the key sequence is detected by the controller 8 and then, using the pointers P11, P12, text item 1 and text item 2 are retrieved from the memory addresses A11 and A12. The text items are then displayed on the display 5 shown in Figure 3. The user then operates scrolling key 4c to move the focus window 18 so as to select either "home" or "good" in order to resolve the ambiguity.

This process is shown in more detail in Figure 5. At step s5.1, the controller 8 detects an individual ambiguous key sequence KS and at step s5.2 retrieves the or each text item associated with the identified key sequence.

At step s5.3, a test is made to see whether more than one text item is retrieved. If only one is retrieved, it is displayed on the display 5 of the mobile handset at step s5.4 and also inserted into the text message at step s5.5.

Alternatively, if more than one text item is retrieved, the retrieved items are displayed at step s5.6 and the display 5 of the handset at step s5.6. The display may be configured so as to present the most probable text item first or preferentially. For example, the text items may be configured in the column ranked according to the probability, based on previous usage. The user then selects one of the displayed items and inserts it in a message at step s5.7.

Figure 4 also illustrates the memory configuration of the address book stored in SIM card 13. Individual names and telephone numbers are stored in the memory for SIM card 13 and three entries are shown with individual address locations AM1, AS1 and AZ1. Considering the entry at location AM1, the subscriber has entered the name "James" with an associated telephone number. Also, data D1 may be associated with the entry for example, an e-mail and/or postal address.

The text entries need not necessarily comprise conventional words to identify the persons concerned. For example, the entry at location AM1 concerns a person

identified by the nickname "geezer" and the person identified at location AZ1 is named "coolbabe".

In accordance with the invention, the names stored in the address book locations are associated with their corresponding ambiguous key sequences KS. Thus, as shown in Figure 4, the ambiguous key sequence KSM has associated pointers PM1, PM2 etc. In this example, the pointer PM1 points to the memory address location AM1 in SIM card 13, corresponding to the name entry - James. The other pointers associated with the key sequence KSM, namely PM2.... PMn point to items in the disambiguation dictionary in the manner previously described in relation to sequence KS1. Considering the entry "James" in more detail, the corresponding ambiguous key sequence comprise operation of keys "5, 2, 6, 3, 7". This key sequence also corresponds to the word "lanes", which is found at memory location AM2 in the disambiguation dictionary 19.

Similarly, an ambiguous key sequence KSS corresponding to "geezer" and associated pointers to text items in the disambiguation dictionary and, additionally, the pointer PS1 directed to memory location AS1 in the SIM card. Also, for "coolbabe" the corresponding key sequence KSZ has a pointer PZ1 pointing to memory location AZ1 in the SIM card 13.

When the user types an ambiguous key sequence corresponding to the nickname, the process previously described with reference to Figure 5 is carried out to retrieve text items associated with the key sequence which not only include the items from the disambiguation dictionary but also items stored in the address book on SIM card 13. Thus for example when a user types a SMS to "coolbabe" the disambiguation software will present "coolbabe" as a text item when the key sequence KSZ is typed. Thus, the text item "coolbabe" will be presented as an option to the user even though the item is a nickname and not found in the disambiguation dictionary 19, which contains conventional words of common usage.

Figure 6 illustrates a process for associating ambiguous key sequences in the memory with entries in the address book. In this example, the association is made

at the time that new entries are made into the address book although the process can be carried out at other times as will be explained later. At step s6.1, the user enters the name and telephone number to be stored in the address book. The entry of the name is carried out by the previously described conventional technique in which the individual keys are operated more than once to select an individual letter. For example, to enter "geezer", the following key operations are performed: 4-key once, 3-key twice, 3-key twice, 9-key four times, 3-key twice and 7-key three times. Thereafter, the appropriate telephone number and any other data D are entered.

At step s6.2, the controller 8 defines a memory location A for the new address book entry to be made on SIM card 13.

Then, at step s6.3 the new entry is stored at the defined memory location.

At step s6.4, the controller 8 determines the ambiguous key sequence KS that corresponds to the name "geezer". In this example, the ambiguous key sequence KSS corresponding to a single key operation for each letter, comprises sequential operation of the keys 4, 3, 3, 9 and 7.

Then, at step s6.5, the controller determines whether the ambiguous key sequence KS is already stored in the memory 10. If not, at step s6.6, the ambiguous key sequence is stored in the memory 10 together with a pointer A which points to the memory address location in SIM card 13 corresponding to the newly stored text item in the address book. Thus, for "geezer", the key sequence KSS is stored in memory 10 with a corresponding pointer PS1 to memory location AS1 in the SIM card 13.

If however, the ambiguous key sequence KS has already been stored in the memory 10 then, at step s6.7, a check is made to determine whether the text item for the new address book entry is already held in the disambiguation dictionary 19. If the text item is already held in the dictionary, there is no need to make a new entry and the process terminates at step s6.8. However, if the text item is not held in the dictionary, a pointer is added to the already stored key sequence KS, corresponding

to the address location of the newly stored text item in the address book on SIM card 13, thereby providing a pointer for the ambiguous key sequence corresponding to the address book entry to enable it to be accessed by the disambiguation software.

Many modifications and variations fall in the scope of the claimed invention. For example, the ambiguous key sequences corresponding to the address book entries need not necessarily be set-up at the time of entering new items into the address book. The process could be carried out retrospectively for items already entered into an address book, for example when SIM cards are changed in the handset MS1.

Furthermore, the memory organisation may be configured differently from the described example. The disambiguation dictionary 19 and/or software 20 need not necessarily be held in the flash memory 10 but could instead be held in ROM 9. Furthermore, the address book need not necessarily be held on SIM card 13 but could be held in another memory location such as the flash memory 10. Also text entries made in the address book on SIM 13 may be copied into the dictionary 19 to facilitate the text retrieval process, with all the pointers P pointing to locations in the memory location that contains the dictionary 19.

Also, the disambiguation software can be used not only to compose SMS but also to assist in retrieving address book entries when making a call, thus speeding the retrieval of the nickname and hence the telephone number associated with the nickname, to enable the number to be dialled automatically.

Also, the handset MS1 may be enabled for wireless application protocol (WAP) operation and thus capable of sending e-mails. Accordingly, the other data D1, D2... may comprise an e-mail address and the disambiguation software may be used to retrieve the e-mail address by entering the ambiguous key sequence associated with the nickname for the intended addressee. Furthermore, the disambiguation software may be used during the composition of the text for an e-mail message so as to permit the name of the recipient held in the address book to be inserted into a message itself by use of its associated ambiguous key sequence e.g. "hi geezer".

The invention is not restricted to mobile telephone handsets but can also be applied to personal digital assistants and other communications devices with address books, which may or may not be mobile.

Claims

1. A data communications device for sending communications containing textual information to individual recipients, comprising an address memory containing routing information for routing a communication to an individual recipient as selected by a user, the routing information for the recipient containing textual information corresponding to their name, a plurality of keys each associated with a respective plurality of different text characters, the keys being operable by the user to produce an ambiguous key sequence corresponding to an item of textual information for the communication, a memory configuration to store different ones of said ambiguous key sequences and to associate with each thereof at least one item of textual information corresponding to the ambiguous key sequence, and a data processor operable in response to the user actuating the keys to produce one of the ambiguous key sequences, to retrieve the textual information associated therewith from the memory configuration to permit the user to disambiguate the key sequence, wherein an ambiguous key sequence corresponding the name of a recipient stored in the address memory is stored in the memory configuration and associated with said name whereby to retrieve text corresponding to the name in response to the user actuating the keys to produce the ambiguous key sequence associated with the name.

2. A device according to claim 1 wherein the address memory comprises a memory unit that is removable from the communications device.

3. A device according to claim 2 wherein the address memory is held on a smart card.

4. A device according to any preceding claim including a display device to display the text items retrieved by the processor so as to enable the key sequence to be disambiguated.

5. A device according to any preceding claim, comprising a mobile telephone handset.

6. A device according to any preceding claim, comprising a PDA.

7. A device according to any preceding claim configured for composing and sending text messages.

8. A device according to claim 7 configured for composing and sending a SMS.

9. A device according to claim 7 configured for composing and sending an e-mail.

10. A mobile communications device with an address book and disambiguation software operable disambiguate inputted text, characterised in that the software is operable in respect of text entries in the address book.

11. A communications device substantially as hereinbefore described with reference to the accompanying drawings.

12. Disambiguation software for a mobile communications device with an address book, operable to disambiguate inputted text, characterised in that the software is configured to be operable in respect of text entries in the address book.

13. A method of programming communications device according to any preceding claim, comprising identifying an ambiguous key sequence corresponding to a name for the address memory, and storing an association between the identified ambiguous key sequence and the name.

14. A method according to claim 13 including identifying the key sequence and storing the association when a name is entered into the address memory.

15. A smart card for use with a communication device, comprising an address book of names and associated address information configured for use with disambiguation software, wherein the names in the address book are utilisable by the software.

16. A smart card according to claim 15 and comprising a SIM card.

17. A smart card substantially as hereinbefore described with reference to the accompanying drawings.

18. A method of operating a communications device substantially as hereinbefore described with reference to the accompanying drawings

16

INVESTOR IN PEOPLE

Application No: GB 0028466.1 **Examiner:** Anita Keogh
Claims searched: 1-18 **Date of search:** 27 July 2001

Patents Act 1977
Amended Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): G4H (HKK), H4K (KFH, KBNJ), H4L (LECCX, LEUF, LEUG, LESF)

Int Cl (Ed.7): G06F (3/02, 3/023, 17/30), H03M (11/00), H04M (1/247, 1/27, 1/2745), H04Q (7/32)

Other: Online: WPI. JAPIO, EPODOC

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2347247 A	(NOKIA) see whole document, especially page 6 lines 4-27, page 16 lines 11-19 and fig. 3	1-13, 15-18
X	GB 2335059 A	(INVENTEC CORP.) see whole document, especially page 5 lines 22-29 and page 6 line 15 to page 8 line 19	1, 4, 5, 6, 10, 12, 13, 14,
X	GB 2266797 A	(NOKIA) see whole document	1, 4, 5, 6, 10, 11, 12, 13, 14
X	EP 0651315 A1	(IBM) see whole document, especially page 2 lines 44-47 and page 4 lines 56-58	1, 4, 5, 6, 10, 12, 13, 14
X	WO 00/24179 A1	(KIM) see whole document	1, 4, 5, 6, 10, 12, 13

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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